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Job No: CTCE/BBMP/KRIDL/W.No.13/BC/Bitumen/2017-18 12.01.2018

TEST REPORT ON BITUMEN CONTENT AFTER GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

* Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
* Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
* Name of Work	:	Improvements to Roads and asphalting at pipeline road left side and other roads in Mallasandra Ward No.13 in Shettyhalli Sub Division , BBMP, Bangalore.
* Reference	:	BBMP/EE/DD/WO/147/2017-18 Dated: 21.12.2017
* Sample ID	:	Pipeline roads in Mallasandra Ward No.13, BBMP, Bangalore.
Technical Reference	:	IS 2386 and IRC:SP:11-1984
Date of Testing	:	12.01.2018

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	35.24	7.45	7.45	92.55	79-100
9.5	34.26	7.24	14.69	85.31	70-88
4.75	73.15	15.47	30.16	69.84	53-71
2.36	61.22	12.94	43.10	56.90	42-58
1.18	52.32	11.06	54.16	45.84	34-48
0.6	56.65	11.98	66.14	33.86	26-38
0.3	46.63	9.86	76.00	24.00	18-28
0.15	36.69	7.76	83.75	16.25	12-20
0.075	48.25	10.20	93.96	6.04	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	34.22	7.25	7.25	92.75	79-100
9.5	48.21	10.21	17.46	82.54	70-88
4.75	61.22	12.97	30.43	69.57	53-71
2.36	76.33	16.17	46.61	53.39	42-58
1.18	64.25	13.61	60.22	39.78	34-48
0.6	56.33	11.93	72.15	27.85	26-38
0.3	32.15	6.81	78.96	21.04	18-28
0.15	22.35	4.74	83.70	16.30	12-20
0.075	39.65	8.40	92.10	7.90	4-10

*Information is furnished by the Customer/Representative.

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Note:

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⇒The results indicated above are based on the tests carried out on the samples received in the laboratory.

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Job No.: CTCE/BBMP/KRIDL/W.No.13/BC/Agg/2017-18 11.01.2018

TEST REPORT ON GRADATION OF AGGREGATE

* Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
* Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
* Name of Work	:	Improvements to Roads and asphalting at pipeline road left side and other roads in Mallasandra Ward No.13 in Shettyhalli Sub Division , BBMP, Bangalore.
* Reference	:	BBMP/EE/DD/WO/147/2017-18 Dated: 21.12.2017
* Sample ID	:	Bituminous Concrete
Technical Reference	:	IS : 2386(Part -1)-1963 (RA-2011)
* Type of Mix	:	Hot mix plant, Bangalore
Date of Testing	:	11.01.2018

Total Weight of Sample: **5150** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per `MORTH 500-18
13.2	745	14.47	14.47	85.53	79 - 100	
9.5	580	11.26	25.73	74.27	70 - 88	
4.75	645	12.52	38.25	61.75	53 - 71	
2.36	560	10.87	49.13	50.87	42 - 58	
1.18	520	10.10	59.22	40.78	34 - 48	
0.600	560	10.87	70.10	29.90	26 - 38	
0.300	460	8.93	79.03	20.97	18 - 28	
0.150	270	5.24	84.27	15.73	12 - 20	
0.075	425	8.25	92.52	7.48	4 - 10	

Total Weight of Sample: **5250** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH 500-18
13.2	610	11.62	11.62	88.38	79 - 100	
9.5	640	12.19	23.81	76.19	70 - 88	
4.75	635	12.10	35.90	64.10	53 - 71	
2.36	600	11.43	47.33	52.67	42 - 58	
1.18	585	11.14	58.48	41.52	34 - 48	
0.600	535	10.19	68.67	31.33	26 - 38	
0.300	515	9.81	78.48	21.52	18 - 28	
0.150	360	6.86	85.33	14.67	12 - 20	
0.075	480	9.14	94.48	5.52	4 - 10	

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Job No.: CTCE/BBMP/KRIDL/W.No.13/BC/Agg/2017-18 12.01.2018

TEST REPORT ON GRADATION OF AGGREGATE

*** Customer**	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
*** Agency**	:	**Technical Manager (West),** KRIDL, Bangalore.
*** Name of Work**	:	Improvements to Roads and asphalting at pipeline road left side and other roads in Mallasandra Ward No.13 in Shettyhalli Sub Division , BBMP, Bangalore.
*** Reference**	:	BBMP/EE/DD/WO/147/2017-18 Dated: 21.12.2017
*** Sample ID**	:	Bituminous Concrete
Technical Reference	:	IS : 2386(Part -1)-1963 (RA-2011)
*** Type of Mix**	:	Hot mix plant, Bangalore
Date of Testing	:	12.01.2018

Total Weight of Sample: **5225** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per `MORTH 500-18
13.2	755	14.45	14.45	85.55	79 - 100	
9.5	590	11.29	25.74	74.26	70 - 88	
4.75	630	12.06	37.80	62.20	53 - 71	
2.36	555	10.62	48.42	51.58	42 - 58	
1.18	545	10.43	58.85	41.15	34 - 48	
0.600	580	11.10	69.95	30.05	26 - 38	
0.300	440	8.42	78.37	21.63	18 - 28	
0.150	265	5.07	83.44	16.56	12 - 20	
0.075	430	8.23	91.67	8.33	4 - 10	

Total Weight of Sample: **5325** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH 500-18
13.2	605	11.36	11.36	88.64	79 - 100	
9.5	625	11.74	23.10	76.90	70 - 88	
4.75	650	12.21	35.31	64.69	53 - 71	
2.36	615	11.55	46.85	53.15	42 - 58	
1.18	590	11.08	57.93	42.07	34 - 48	
0.600	540	10.14	68.08	31.92	26 - 38	
0.300	525	9.86	77.93	22.07	18 - 28	
0.150	390	7.32	85.26	14.74	12 - 20	
0.075	475	8.92	94.18	5.82	4 - 10	

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/KRIDL/W.No.13/BC/Stability/2017-18 11.01.2018

TEST REPORT ON MARSHALL STABILITY OF MIX

*** Customer**	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
*** Agency**	:	**Technical Manager (West),** KRIDL, Bangalore.
***Name of the Work**	:	Improvements to Roads and asphalting at pipeline road left side and other roads in Mallasandra Ward No.13 in Shettyhalli Sub Division , BBMP, Bangalore.
***Reference**	:	BBMP/EE/DD/WO/147/2017-18 Dated: 21.12.2017
*** Source**	:	Hot mix Plant, Bangalore
*** Type of Mix**	:	Bituminous Concrete
Date of Testing	:	11.01.2018

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshall Stability (Kn at 60°C)	9.40	9.85	9 Kn (min)
2	Marshall flow (mm)	3.15	3.30	2 – 4
3	Voids in Compacted Mix %	3.60	4.25	3 – 6
4	Percent voids in Mineral Aggregate (VMA)	13.20	14.50	13 - 15
5	Percent Voids filled with Bitumen (VFB)	66.85	67.90	65 - 75
6	Density, g/cc	2.28	2.29	--

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ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ಬಾನಸವಾಡಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

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TEST REPORT ON MARSHALL STABILITY OF MIX

*** Customer**	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
*** Agency**	:	**Technical Manager (West),** KRIDL, Bangalore.
***Name of the Work**	:	Improvements to Roads and asphalting at pipeline road left side and other roads in Mallasandra Ward No.13 in Shettyhalli Sub Division , BBMP, Bangalore.
***Reference**	:	BBMP/EE/DD/WO/147/2017-18 Dated: 21.12.2017
*** Source**	:	Hot mix Plant, Bangalore
*** Type of Mix**	:	Bituminous Concrete
Date of Testing	:	12.01.2018

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshall Stability (Kn at 60°C)	9.60	9.90	9 Kn (min)
2	Marshall flow (mm)	3.30	3.45	2 – 4
3	Voids in Compacted Mix %	4.15	4.60	3 – 6
4	Percent voids in Mineral Aggregate (VMA)	13.35	14.55	13 - 15
5	Percent Voids filled with Bitumen (VFB)	67.25	68.60	65 - 75
6	Density, g/cc	2.27	2.28	--

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ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಸಿ.ಪಿ.ಡಿ. ಬ್ಲಾಕ್, ಜಯಂತಿನಗರ, ಬೆಂಗಳೂರು

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